

# EVALUATION OF PACIFIC LAMPREY PASSAGE IN THE LOWER COLUMBIA RIVER USING HD-PIT AND RADIO-TELEMETRY

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# Topics to be covered

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Describe Half-Duplex Coverage at BO, TD, and JD dams

Using the Half-Duplex System

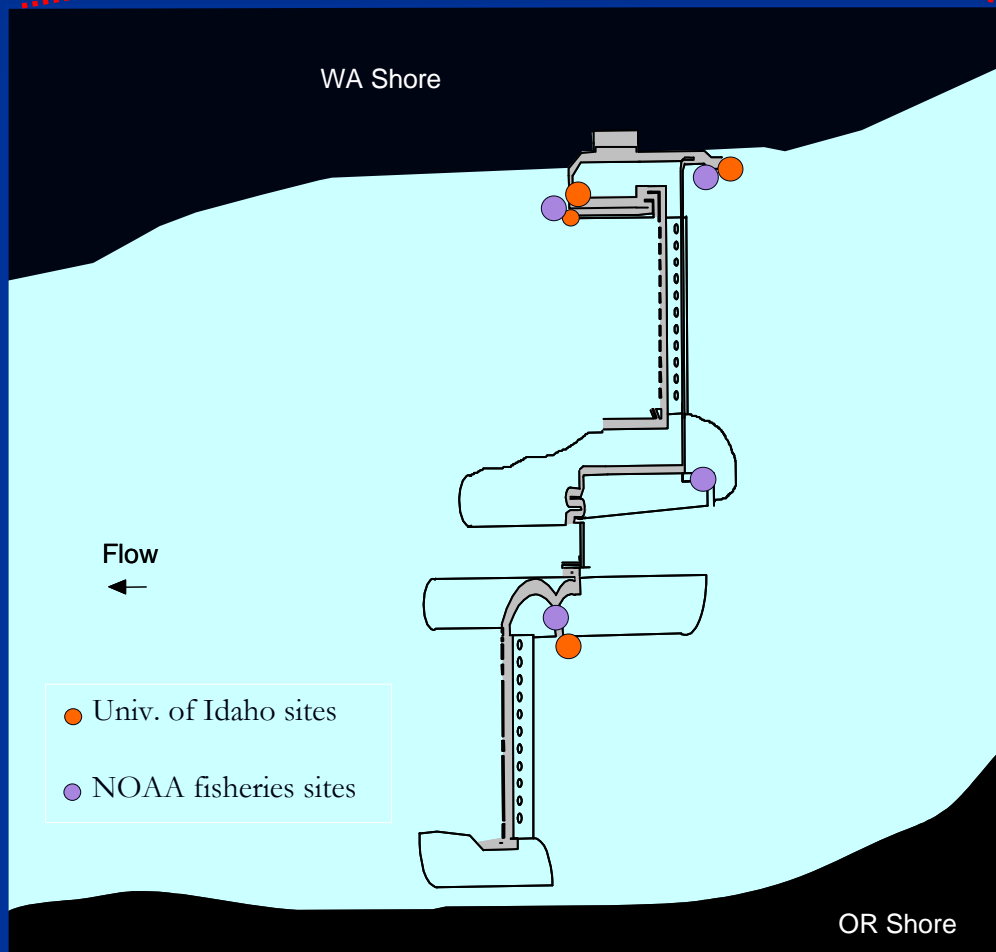
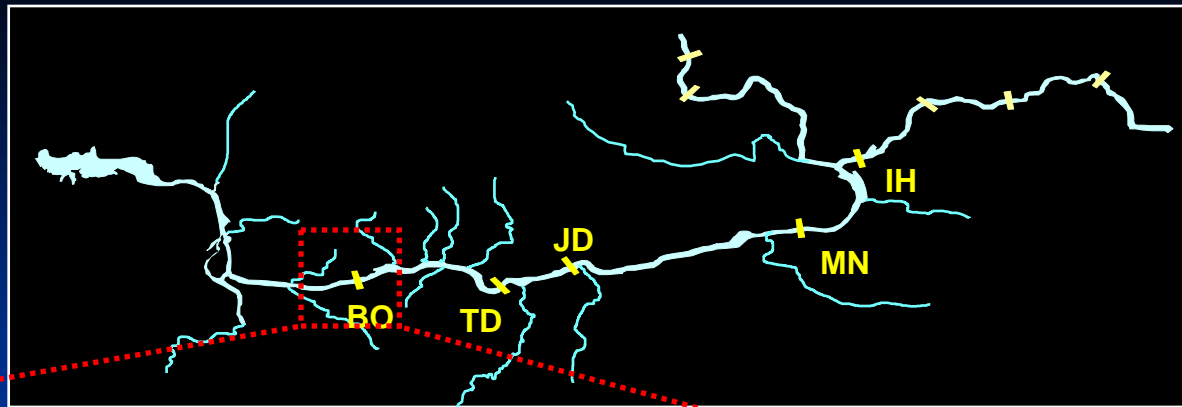
- Passage times and rates at dams and through dam-to-dam reaches
- Reach conversion estimates
- Detection efficiencies

Comparison of HD results with RT results

# HD PIT installations



## Bonneville coverage



### Washington Shore Fishway

- Inside and outside entrance
- Weir above transition pool
- Ladder exit
- Lamprey bypass system (LPS)

### Cascade Island

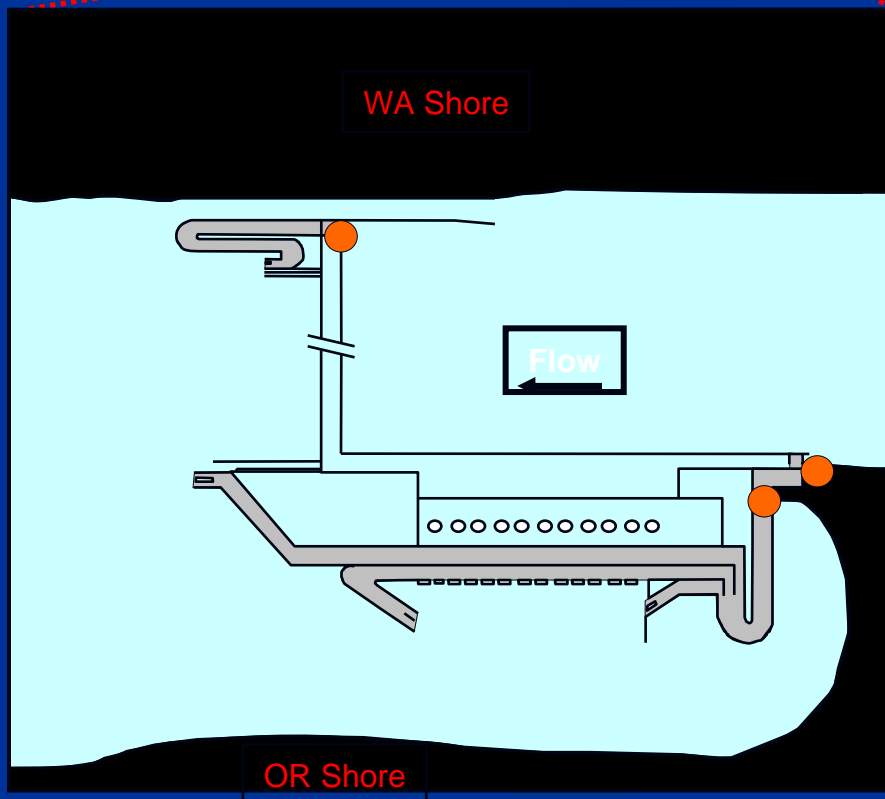
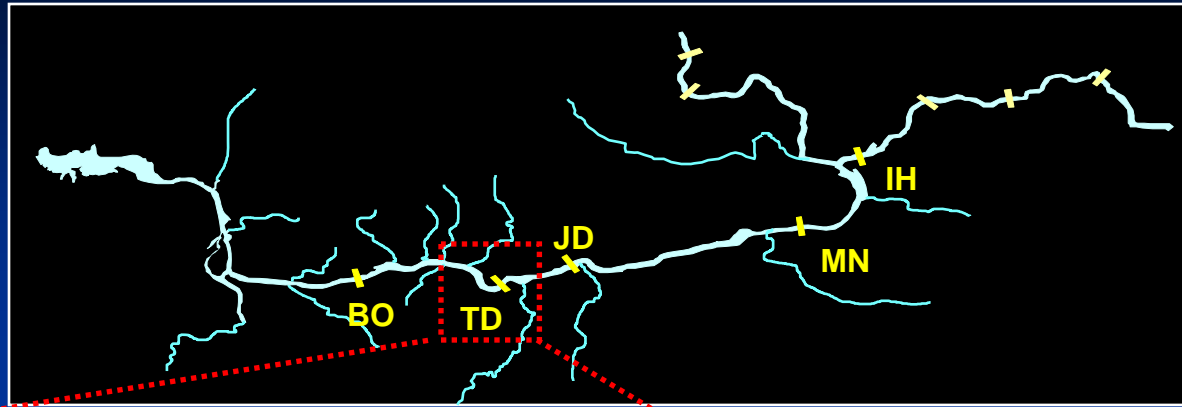
- LPS

### Bradford Island Fishway

- LPS
- Ladder exit



# The Dalles coverage



Washington shore

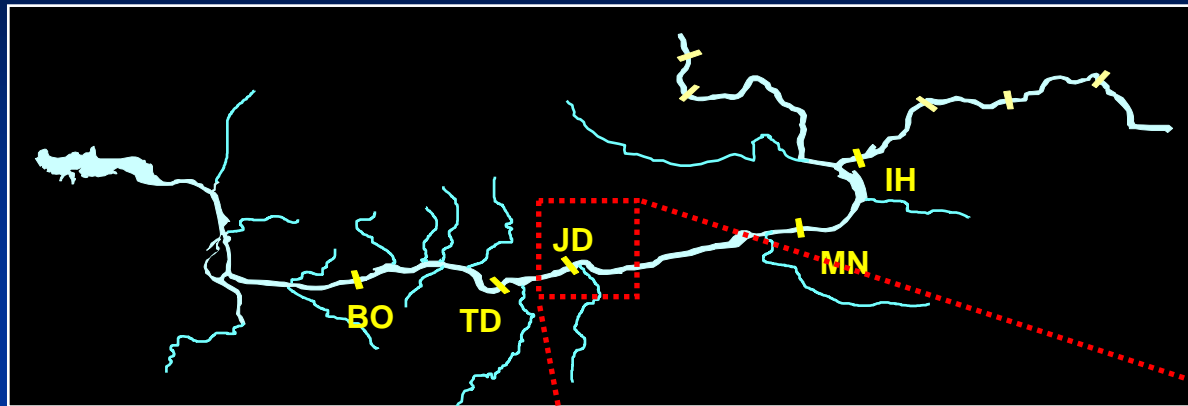
- Ladder exit

Oregon shore

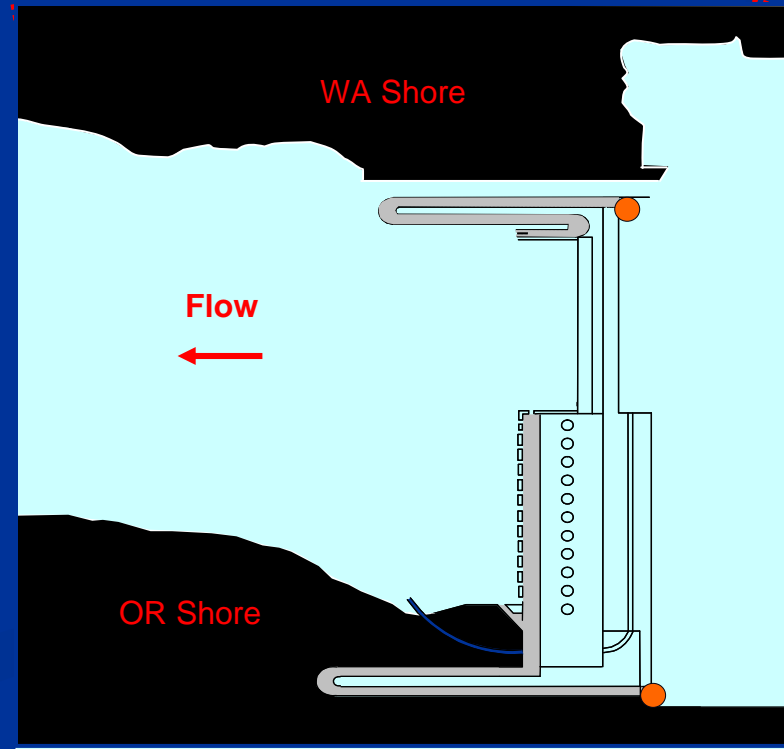
- Near turnpool

- Ladder exit

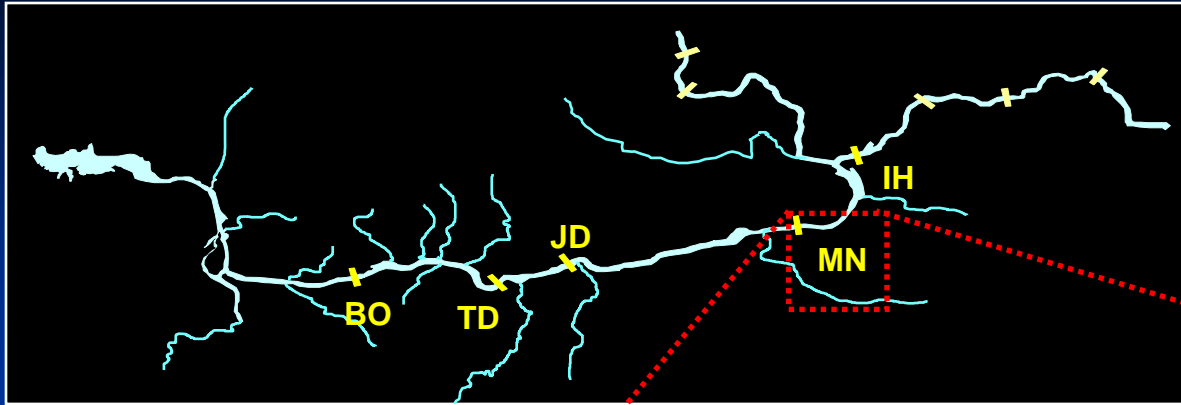
# John Day coverage



Top of ladder exits only



# McNary coverage

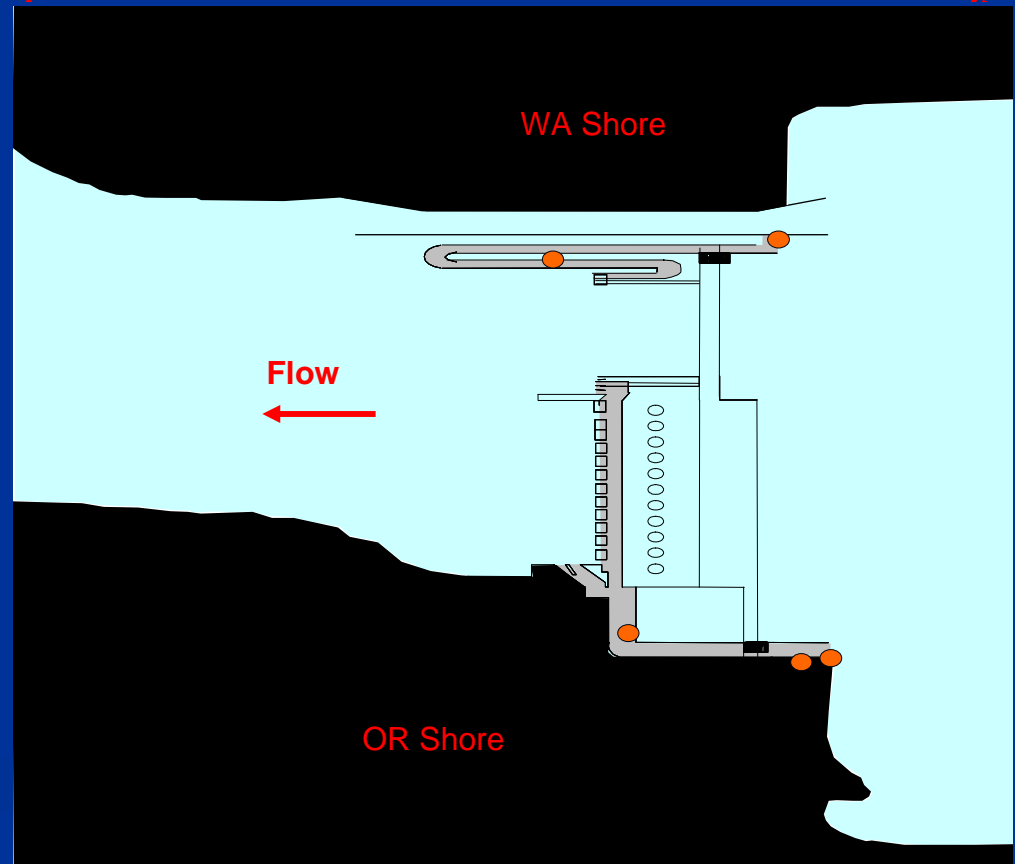


## Washington shore

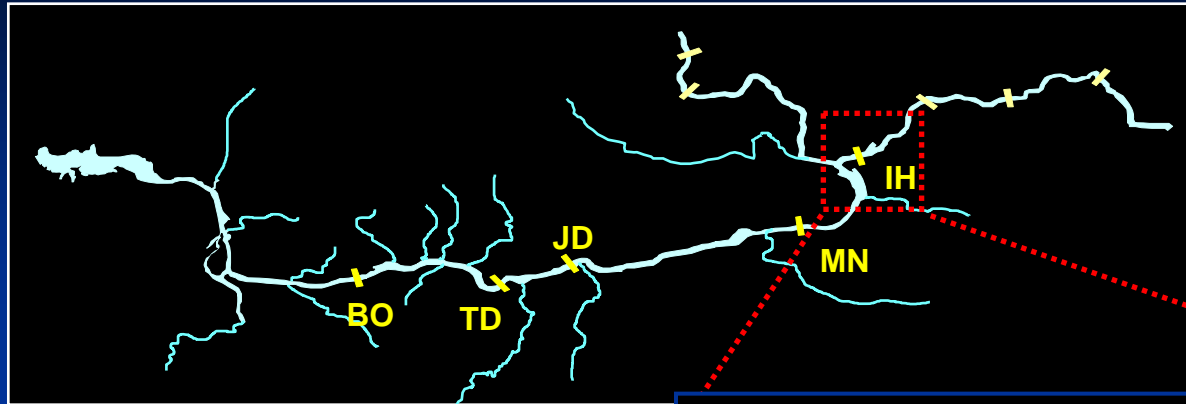
- Weir #274
- Ladder exit

## Oregon shore

- Weir #307
- Ladder exit
- Auxiliary water supply



# Ice Harbor coverage

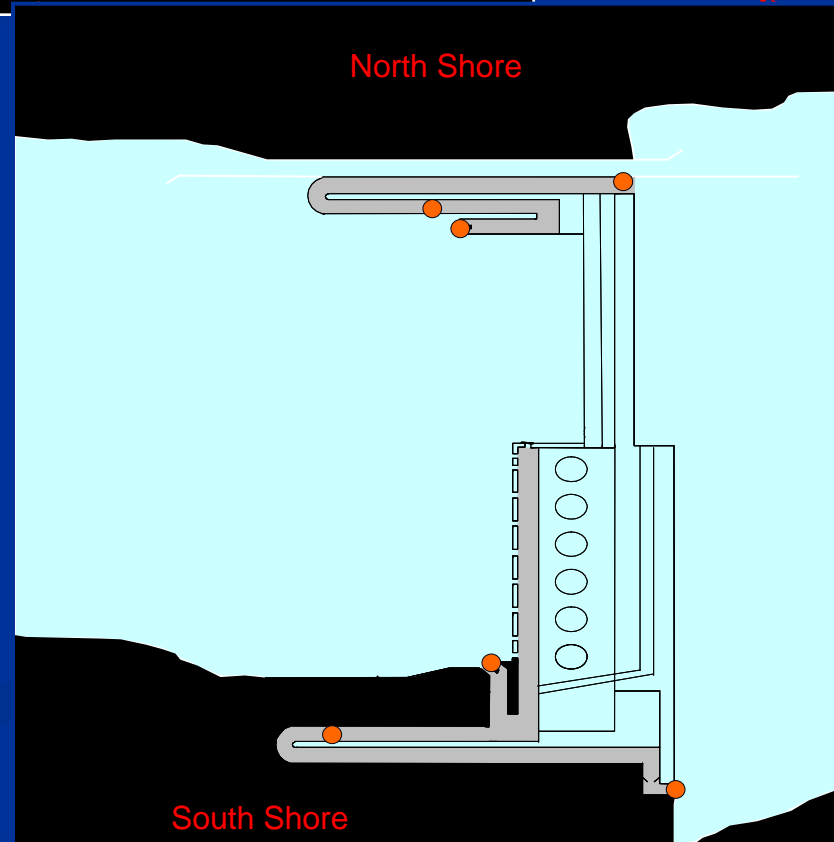


## North shore

- Entrance
- Transition pool
- Ladder exit

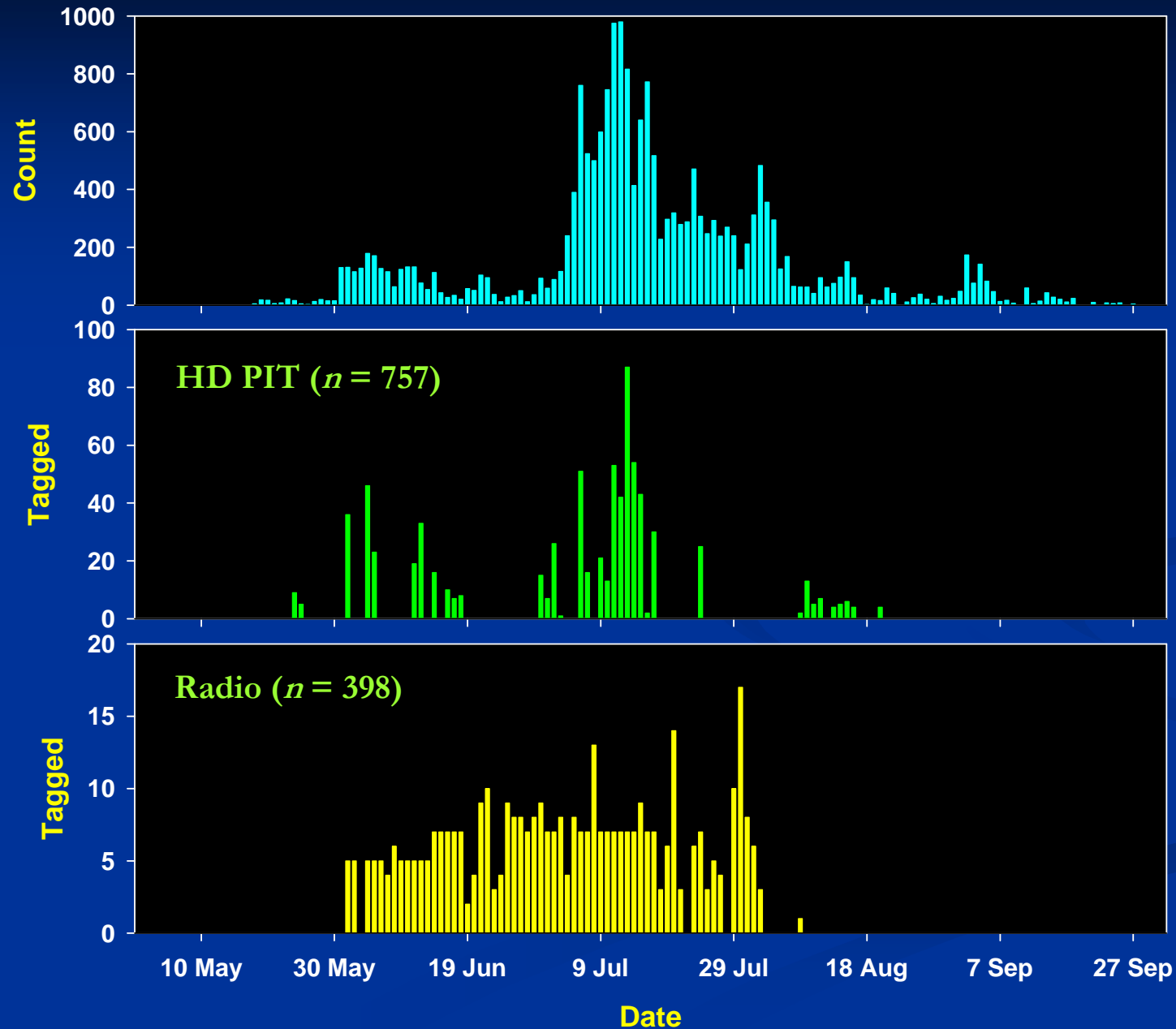
## South shore

- Entrance
- Transition pool
- Ladder exit





# Bonneville counts and tagging effort



## Summary of HD detections (unique fish)

### Bonneville *n*

WA entrance 21

WA transition pool 247

WA ladder exit 219

Bradford ladder exit 102

Cascades Island 64

WA-shore LPS 23

Bradford LPS 30

### The Dalles *n*

East turnpool 145

East ladder exit 120

North ladder exit 94

### John Day *n*

North ladder exit 36

South ladder exit 97

### McNary *n*

North weir #274 12

North ladder exit 10

South weir #307 30

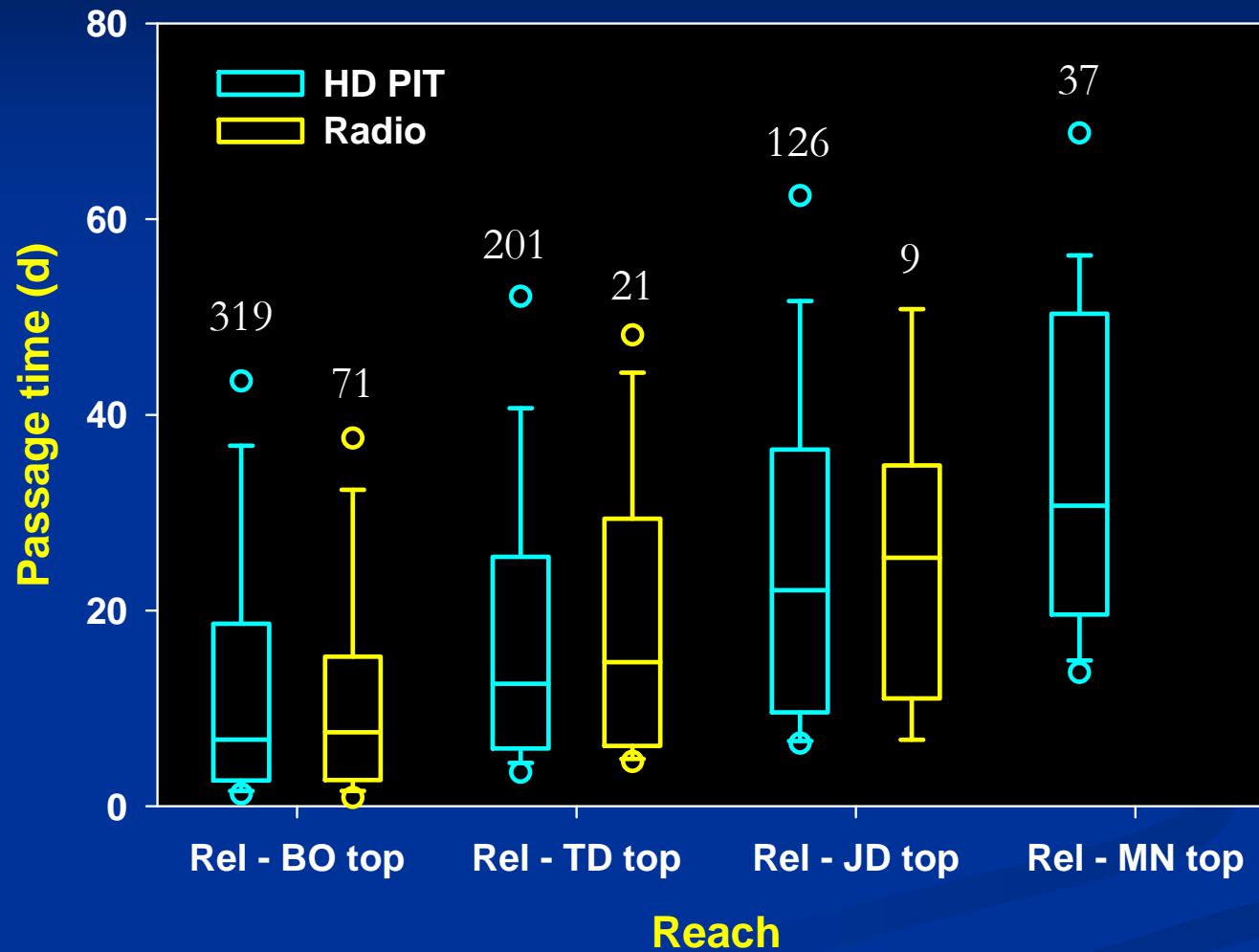
South ladder exit 25

Auxiliary channel 12

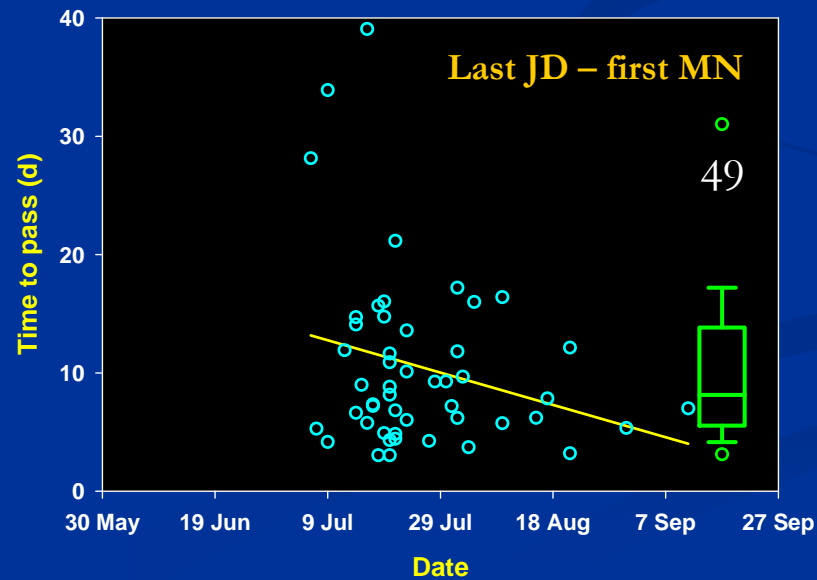
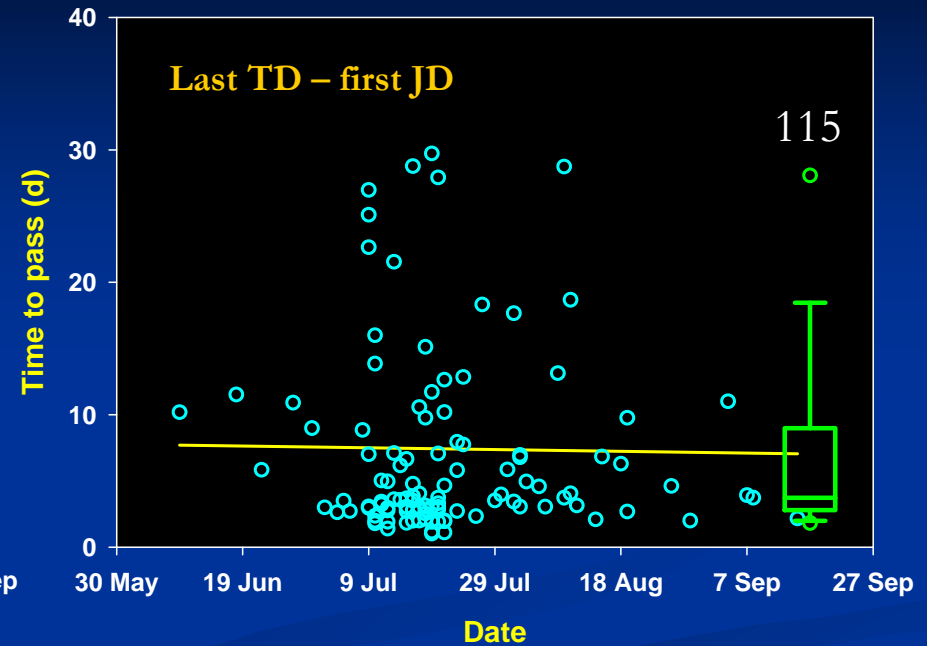
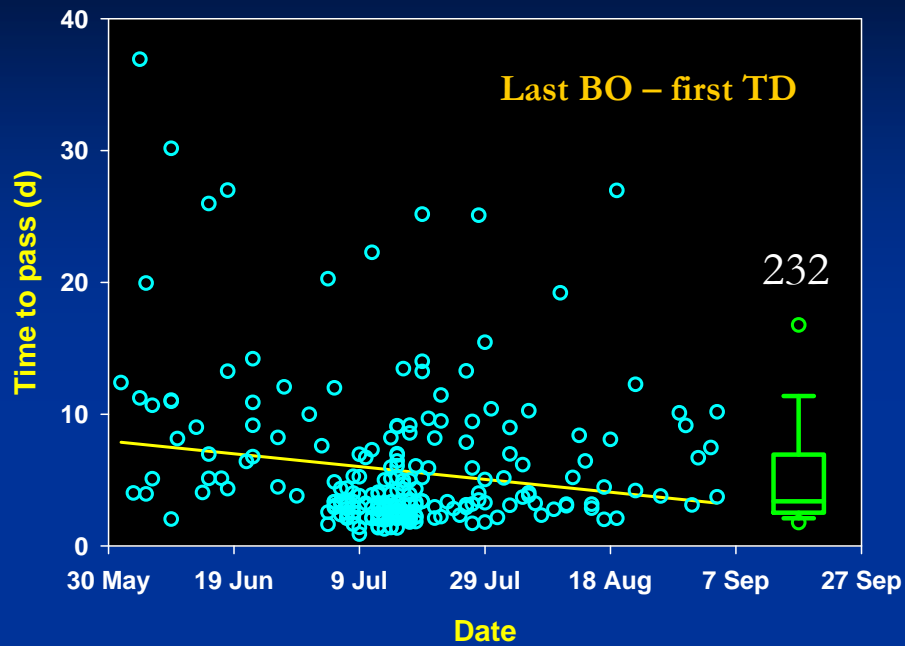
### Ice Harbor

2 – 5 fish at each site

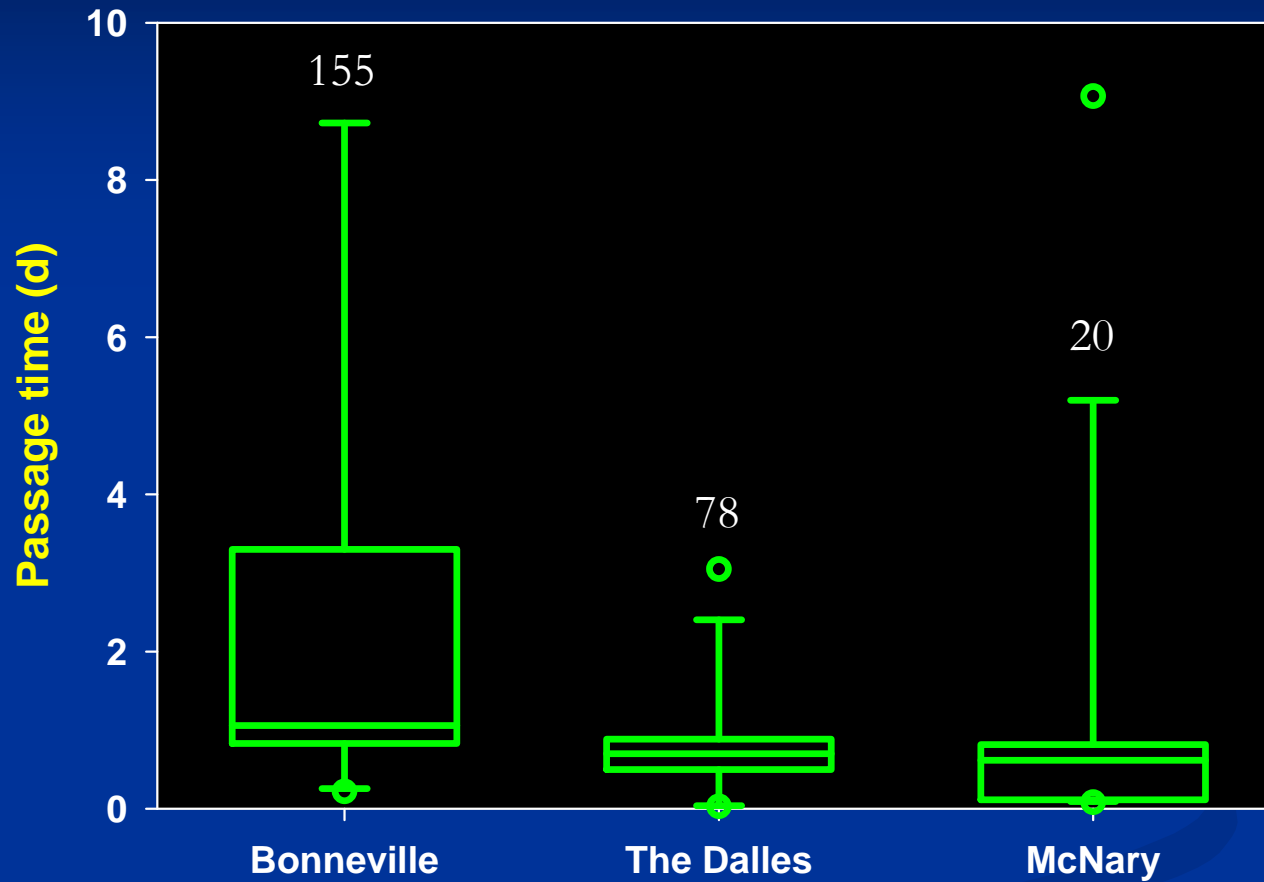
## Passage times: BO release to top-of-ladder sites (HD and Radio)



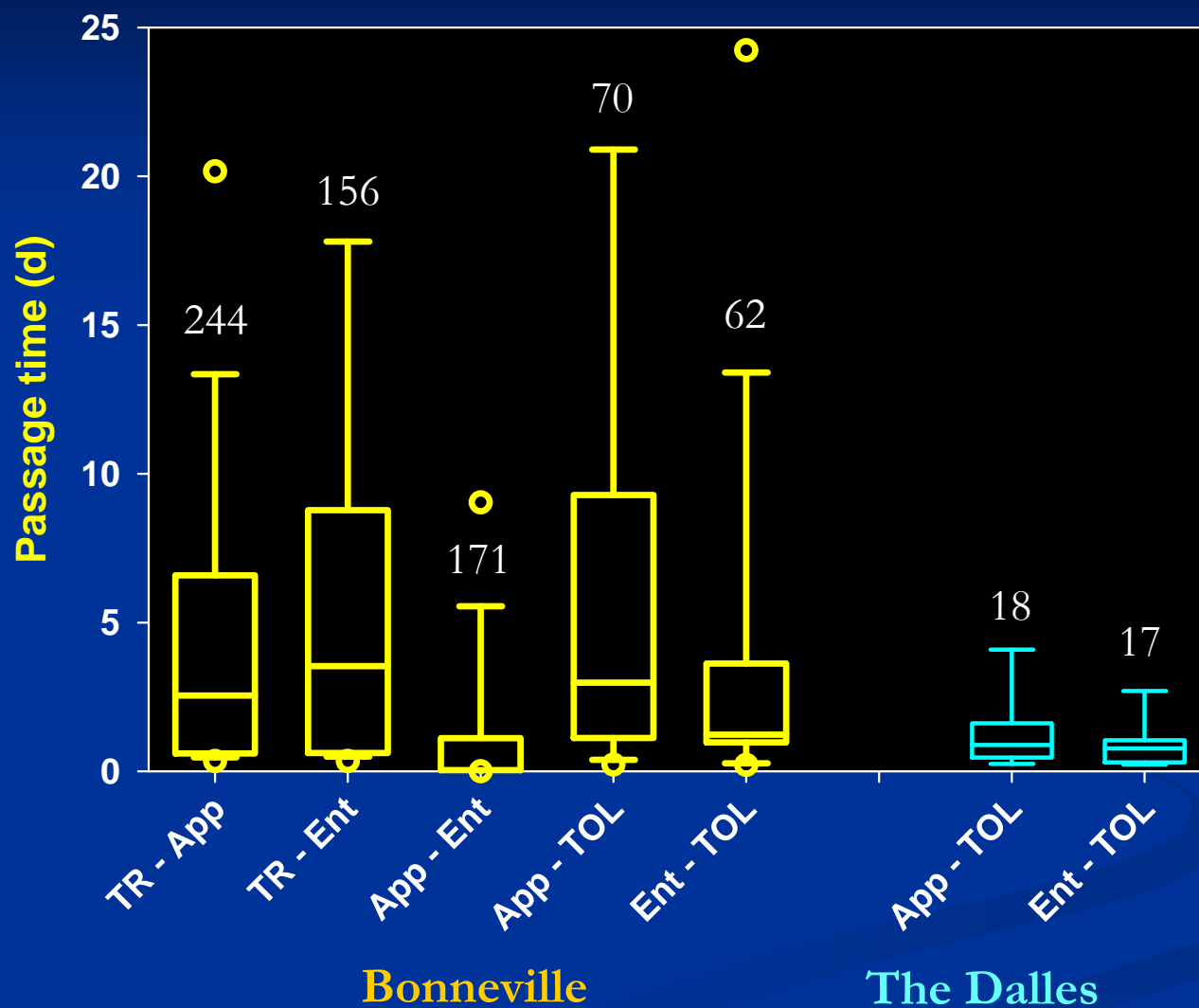
# Passage times: between dams (HD)



## Ladder/Fishway ascension times (HD)

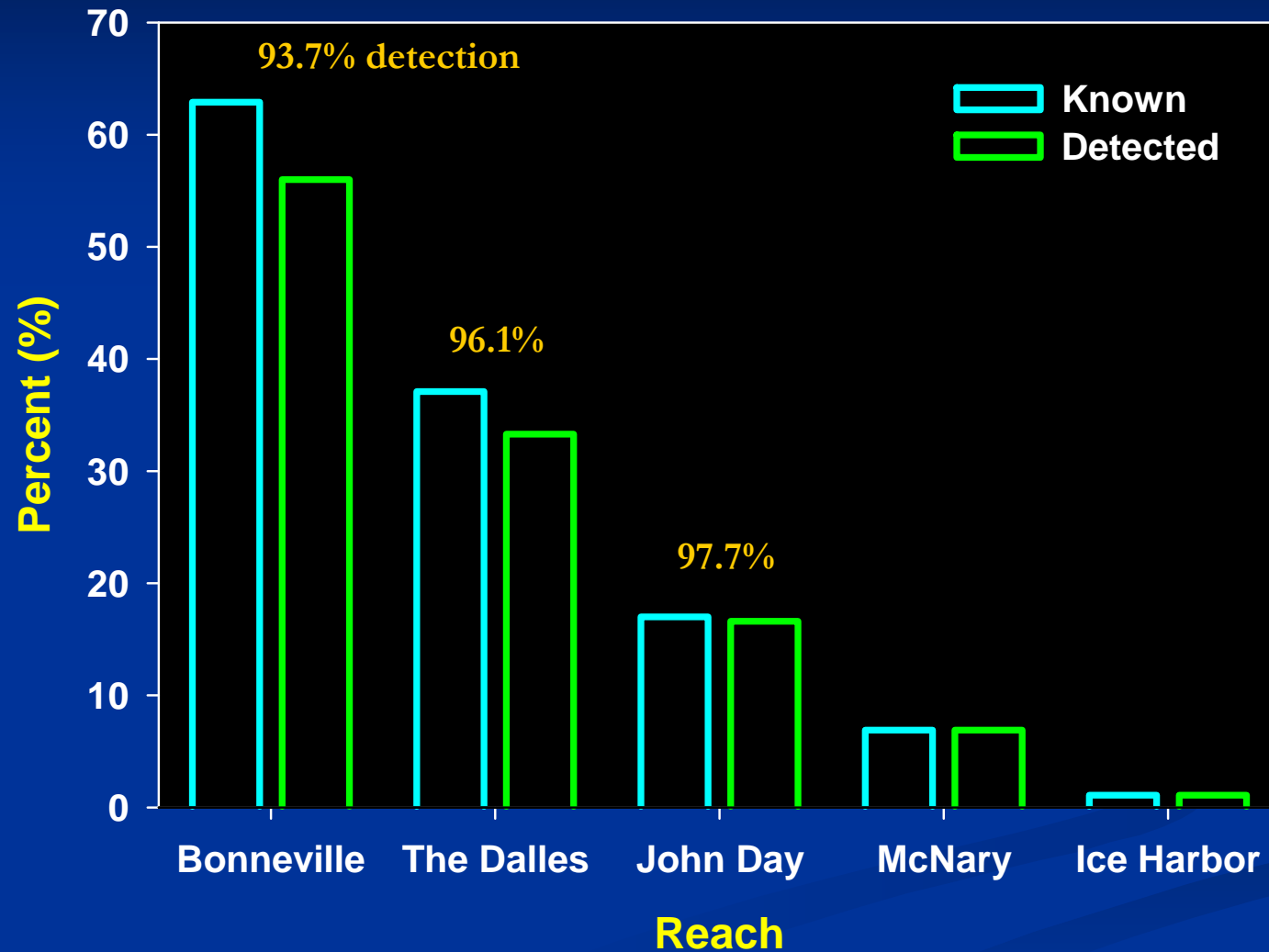


## Passage times at dams (RT)





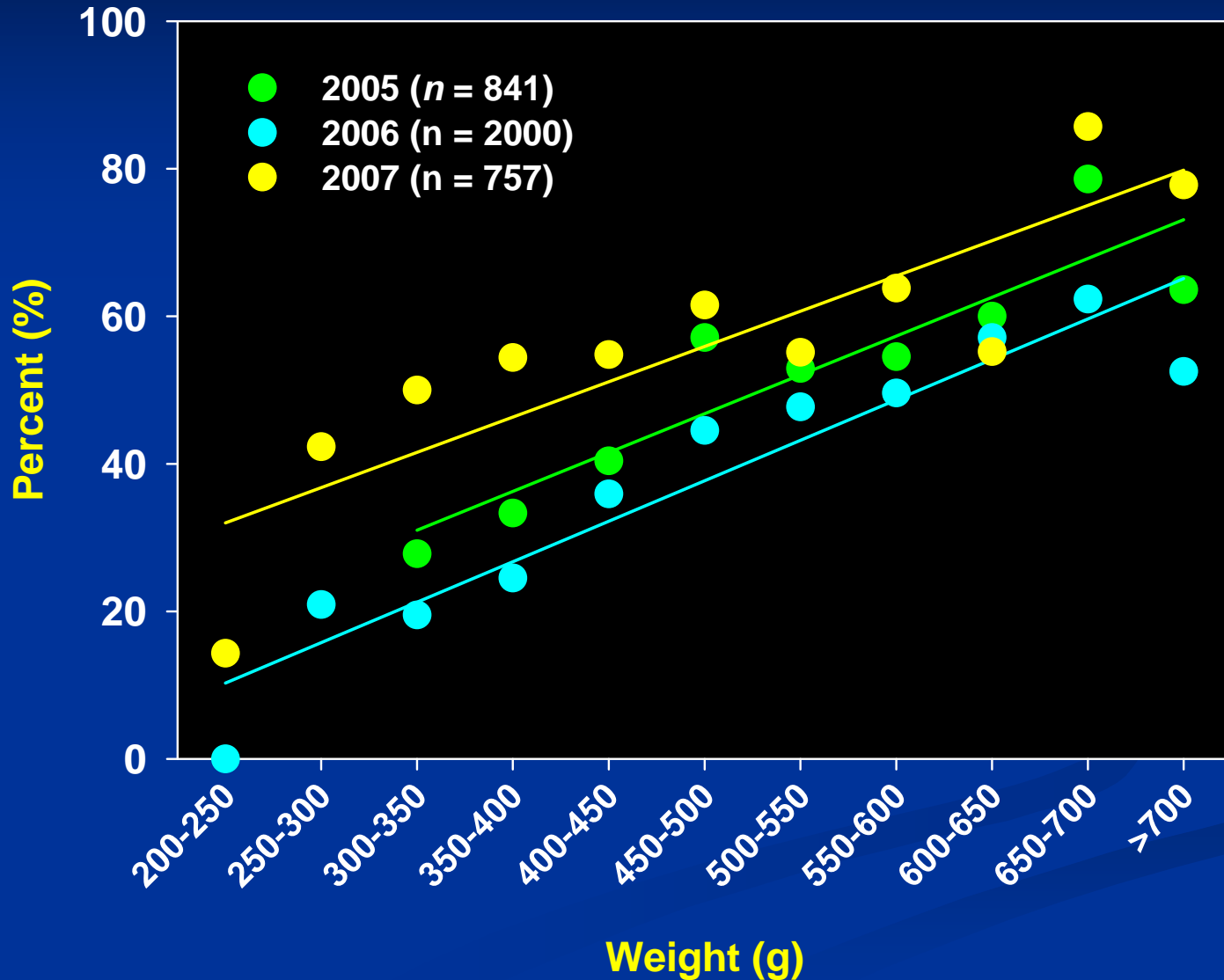
## Conversions to dams from release (HD PIT, $n = 757$ )



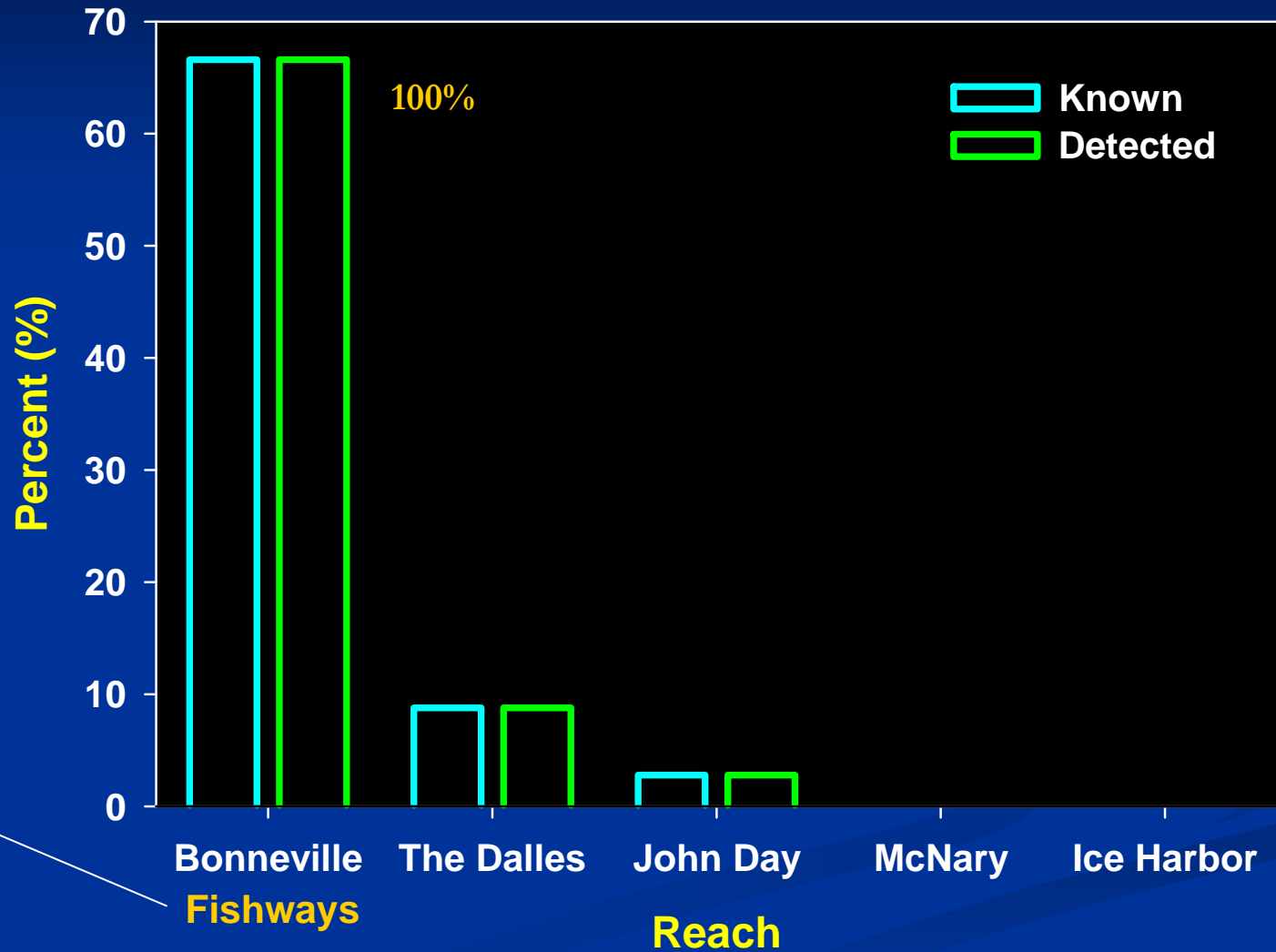
## Percentages past dams from release (HD)

	<u><i>n</i></u>	<u>Percent known past</u>	<u>Detection efficiency</u>
Released	757		
Bonneville	424	56%	88%
The Dalles	252	33%	83%
John Day	129	17%	98%
McNary	35	4%	94%
Ice Harbor	5	1%	

## Conversions from release to Bonneville exit (HD)



## Conversions to dams from release (Radio, $n = 398$ )



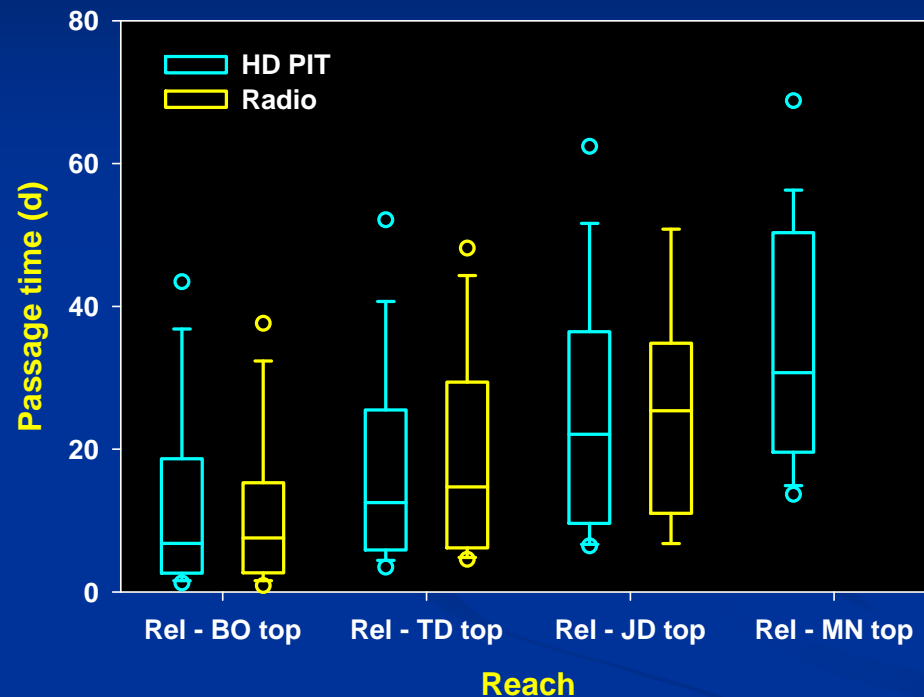
TR recs excluded

## Percentages past dams from release (radio)

	<u><i>n</i></u>	<u>Percent known past</u>	<u>Detection efficiency</u>
Released	398		
Bonneville	82	21%	87%
The Dalles	21	5%	
John Day	9	2%	
McNary	-		
Ice Harbor	-		

## Why were conversions so low for radio-tagged fish?

- Passage times were similar for HD-PIT and RT fish



- Similar percentages of HD and RT fish returned to BO fishways
  - 63% (HD) and 67% (RT)



## Radio detections compared to previous years

<u>Year</u>	<u>n</u>	<u>Release to Bonneville top</u>	<u>Release to The Dalles top</u>	<u>Release to John Day top</u>
2000	299	41%	23%	8%
2001	298	43%	23%	9%
2002	201	46%	23%	9%
2007	398	21%	5%	2%

### Possible explanations

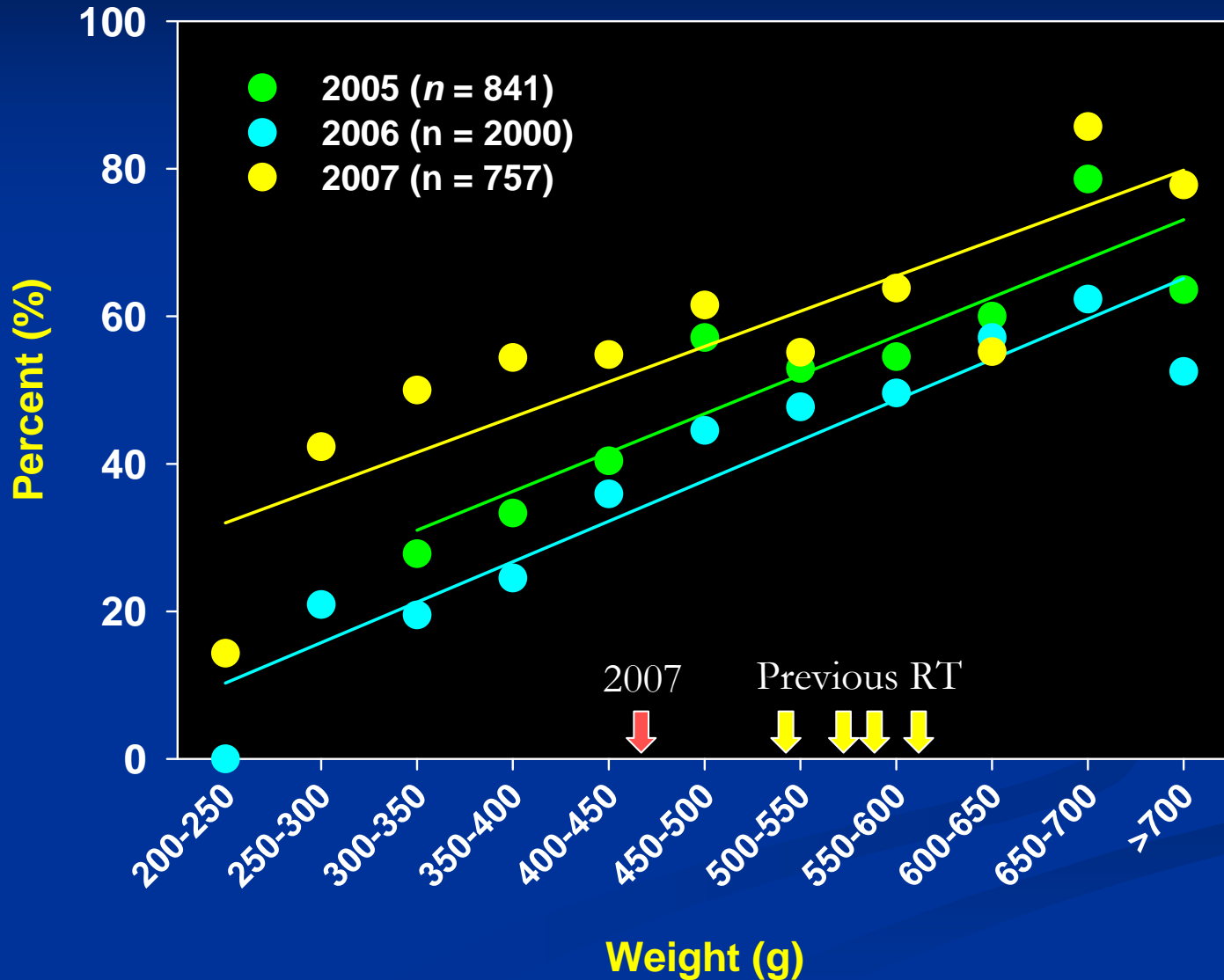
Tag/Handling Effects

Size Effects

Transmitter Longevity

- 2000-2002 data from Moser et al. telemetry reports

# Size and Tag Effect?



# Summary



- HD PIT monitoring system is working
  - Detection efficiencies are ~83-100%
- Upstream passage consistent with previous years
  - 56% past Bonneville
  - 33% past The Dalles
  - 17% past John Day
  - 4% past McNary
- Larger lamprey were more likely to pass upstream
  - Potential management implications
- Passage times were variable, but consistent with previous work
- Evidence for problems with the 2007 RT
  - Double tagging (HD-PIT and RT) is encouraged
  - Keep tag 1% of body weight or less
  - Confirm battery life of transmitters